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VII.

EVOLUTION AND THEOLOGY.

*A REJOINDER.**

IN the last number of this Review four distinguished representatives of the theological school of thought discuss the compatibility of the views of Nature on which the scientific philosophy of the present day is founded with sound doctrine in general, and with the doctrine of design in Nature particularly. To form a clear conception of the field occupied by the discussion, we shall recapitulate the circumstances which gave rise to it, beginning with some preliminary considerations of a general character.

All reasoning is useless unless the person to whom it is addressed admits the premises on which it is based; and all profitable discussion must either commence with some common basis on which both parties agree or must be directed toward finding such a basis, and then ascertaining at what point their lines of thought begin to diverge. Now, in the discussion of the theory of evolution in its various phases, which has been going on for the last twenty years, the point of divergence has never been clearly brought to light. The theory in question, as we shall endeavor to show hereafter, is founded on a certain fundamental postulate respecting the course of Nature. This postulate, being, as is supposed, proved by induction from present observations, has been used as a general key for explaining the operations of Nature during unlimited ages past, and for forming a theory of those operations which it is supposed may hold good through the whole universe of phenomena. In entering upon this daring flight of thought, scientific thinkers have met with unceasing opposition from a school which we may term that of theology. But an examination of the objections of this school fails to show where their line of thought begins to diverge from that of the school of science. They have either built their arguments on

* See, in our preceding issue, the symposium on "Law and Design in Nature."

an entirely independent foundation, or they have attacked the conclusions of the other school at special points, without making it clear whether they admitted or denied the general principles on which these conclusions were founded. The first step in a profitable discussion of the subject must, therefore, be to state those principles, and ascertain whether the two parties agree respecting their validity.

It was with this object that the writer opened the discussion and propounded the question which will be found in our last number. He entered the list not as a partisan of either school, but only as an independent thinker desirous of ascertaining the truth. To him the doctrines of the one school appeared clear and simple, while those of the other did not. He therefore propounded the fundamental postulate of the scientific philosophy in its most comprehensive form, explained it in all its bearings, illustrated its scope by examples and suggested special questions by answering which a decisive conclusion might be reached. The eminent thinkers whose views follow were then asked to explain how far they considered the postulate to be consistent with sound doctrine. They were not, as one of them seems to suppose, expected to accept the whole or none. On the contrary, they were left at liberty to accept or reject any portion, and to state any definite limits within which they would be willing to admit it, but without which they were not willing to do so. In order that they might proceed in a way to be fully understood by the opposite party, the propositions on which they were asked to pass judgment were explained point by point. Finally, as they might object that they were incompetent to express opinions upon scientific questions, and especially to decide whether a scientific doctrine, that of evolution, for instance, was or was not proved, and ought not to be asked to commit themselves to theories of the basis of which they might be doubtful, they were not asked to accept anything as absolutely proved, but only to state whether it would be consistent with sound doctrine to accept it.

Such was the case as it will be found presented. After a most careful study of the answers, the writer confesses himself unable to form a clear idea whether his interlocutors accept or deny the postulate, and can not reach any other conclusion than that they are unwilling to commit themselves decisively one way or the other. At least one or two evade the question presented in a manner which it is extremely difficult to account for on any other ground. For instance, Dr. Porter begins by describing the opening writer as

giving his views of the position of the theological school, and as failing of success in doing so. But if the reader will refer to the first and second pages of the opening article he will find that the writer makes no attempt to state the position of the theological school. On the contrary, he makes it clearly known that the *raison d'être* of the whole discussion is that he does not know what the position of the school in question is, and desires it to be explained. Then Dr. Porter goes on to speak of the arguments arrayed by his supposed opponent against a purely theological doctrine. Here again he is equally at fault. No attempt was made to argue in favor of the position taken by the scientific school, and it was distinctly announced in the opening of the paper that no such attempt would be made. Although the question of evolution is almost purely a scientific one, that of the relation of evolution to religious doctrine is not, and belongs to a class with which the scientific thinker as such is incompetent to deal. The most he can do is to assist in the preparation of some logically coherent principles on which both parties to the discussion may unite. What follows of Dr. Porter's paper has so little reference to the questions actually propounded that only a single point need now be touched upon. He criticises the various defects of the postulate, and especially its limitation to the succession of phenomena. This objection is difficult of comprehension. In the opening paper it was distinctly stated that the object of such a limitation was to ascertain whether the two schools agree about phenomena. Admitting the existence of another universe than that of phenomena, does this afford a sufficient reason for declining to express an opinion about the latter?

So far as any clear, consistent, and decisive expression of opinion upon the admissibility of the postulate is concerned, all the answers are of the same class. All, indeed, have this in common—that they argue vigorously for the truth of a proposition which, so far as the writer is aware, has never been denied on scientific grounds—namely, that there is design in Nature. But they leave their answers to the special question propounded to be inferred from the general tenor of their reasoning. In answer to the bearer of the flag of truce who asks to know what terms of peace can be obtained, a general alarm is sounded, and the theological artillery thunders forth in every direction, but the flag-bearer receives no answer from which he can clearly see how the war is to end. All he can do is to make a study of the returns, and see what he can gather from them respecting the views of the other party. On the

minuteness of this study will very largely depend the nature of the conclusions he reaches. The cursory student, taking for granted that the smoke and din of battle necessarily imply a conflict between two opposing forces, may infer that the postulate is unconditionally rejected. But the more careful reader who knows the position of the enemy and the grounds on which the supposed defense is conducted, may see strong indications of a readiness to surrender all that part of the field which can reasonably be claimed by the scientific philosopher.

To appreciate the situation we must bear in mind that the question was that of the compatibility of two schemes of doctrine, one of which we may designate in a general way as that of the universality of natural law, and the other as that of sound theological doctrine. As an example of the latter, the idea of design in Nature was suggested, but the interlocutors were of course expected to take the term in its widest sense. It was therefore to be expected that those who believed law and design to be inconsistent would, as theologians, reject the postulate ; while those who held the two to be compatible would be ready to accept it, or at least to assure the reader that there was no occasion to oppose it on theological grounds. But, curiously enough, instead of taking either of these views, we find that all make a show of opposing the postulate, and yet all unite in saying that there is no incompatibility whatever between natural law and design. That is, they argue on both sides of the question propounded in such a way as to leave the reader in doubt which side they are on.

It is true that between these two mutually destructive positions an apparent avenue of escape is kept in view by the theologians. The turning-point of opposition to the postulate is found in that portion of it which asserts that human investigation can trace no regard to consequences in the operation of natural causes, and it seems to be taken for granted by all that this, in terms, excludes design from the universe. Surely there must here be some misapprehension. It is evident that, if, from the proposition that no design can be traced in Nature by human investigation, our theologians draw the conclusion that none can exist, they can justify this inference only by taking as the major premise of their argument the general proposition that there can be no design in the universe except such as human investigation can trace. In other words, they assume that man may by scientific investigation become acquainted with the ends which the Author of Nature designed to accomplish.

Evidently this is the only ground on which the inference which the theologians seem to regard as self-evident can be based. Yet it can hardly be supposed that they will openly maintain this claim ; indeed, Dr. McCosh expressly admits that there may be cases in which we can not find out the purpose of the Creator.

We can hardly suppose, therefore, that this portion of the argument against the postulate was founded on anything but an inadvertence. We are, however, relieved from the necessity of further argument on this point by the subsequent course of our interlocutors in demolishing the only foundation on which their argument of incompatibility could be based. This they do by further arguing that there is no incompatibility between natural law and design, and do in a manner so complete and satisfactory that their scientific opponents are relieved from all necessity for maintaining the orthodoxy of their doctrines. True, there is still one point on which it would seem that the contest might be maintained—namely, that the scientific side conceives of natural causes as acting without regard to consequences, while theologians do not so conceive them. But is it not of the very essence of all law that consequences shall be disregarded in its enforcement? We conceive that if we accept the fundamental conception of law entertained by all men, no power whatever, not even the Power which made it, or that which executes it, can hold it at his arbitrary will or can execute it in different ways according to the result to be obtained. A law which could be wielded in this way would be no law at all. A human judge must not regard a man's business or family in passing sentence, and, just so far as he is allowed a discretion in the matter, so far he is relieved from the prescriptions of law and not governed by it. In other words, his action is governed partly by law and partly by his own judgment. If the idea of the laws of Nature expressed in the scientific philosophy is correct, then they are absolutely inexorable, leaving nothing to an arbitrary judgment, and thus fulfill a condition to which human laws only approximate. If, then, in arguing the compatibility of natural law and design, our theologians entertain what we conceive to be an almost universal idea of law, their argument is altogether on the side of the scientific postulate. If, on the other hand, they have a different idea of law, and infer that a result can be one thing or the other according to the consequences to follow, and yet be determined by law, they entertain an idea of law which must at least need further definition and illustration.

The question reduces itself to this : Can a law which is enforced

with an absolute disregard of consequences fulfill a purpose? Each of our four theologians argues so vigorously both on the negative and affirmative sides of this question, that the scientist might prudently refrain from attempting a decision.

Important though this question of abstract definition may be, and much as we might desire to know what definition of law the theological school would give us, we are relieved from the necessity of such an inquiry by the circumstance that the whole question can be settled by a decision of special concrete cases. Now, it is remarkable that, although the views and arguments presented by all the theological interlocutors may be clear and satisfactory so far as regards abstract generalities, they almost entirely refrain from answering any of the special questions suggested by the writer, which would enable us to infer their opinion of the question under discussion. Perhaps the most decisive concrete question presented was that of the adaptability of the theories of the motions of the planets, where seeming absolute certainty in regard to the future is attained, with the general doctrines of design and Providence. Either of two replies might have been made to this question: It might have been maintained that the courses of the planets did not symbolize the whole course of Nature, but that there are certain limits of time beyond which our inductions will not hold, or certain realms of Nature where things are not determined by laws of the same fixed character as those which determine the motion of the planets. Or, on the other hand, it might have been maintained that results as certain as the future conjunctions and oppositions of the planets, and the past and future paths of eclipses, were especially designed. Of course, these two answers might have been further limited in various ways, but the reader will find no meeting of the question in either way. Dr. Porter alone discusses it, and he jumps to the conclusion that the first writer would have us conclude that the possibility of inferring a visible purpose is excluded if design is admitted. He then presents what appears to be an unqualified acceptance of the second of the above suggested answers. Then, in reply to what would seem the very pertinent question, why the theologians contest a question the truth of which they do not deny, he replies that they would not do so if the scientific men would insist that the course of Nature manifests design as truly as it does the succession of phenomena. So far as his position can be inferred, it seems to be about this: If you will admit and maintain our proposition, we will maintain and admit

yours ; but, since you refuse ours as having no scientific value, we are bound in retaliation to attack yours.

This decisive question is carefully avoided by all three of the other disputants.

What we have said of the different conclusions which the reader will reach according as he reads rapidly or studies the papers closely, will be most clearly seen in the contributions of Drs. Clarke and McCosh. The latter, after an introduction which is very clear so far as the general principles stated are concerned, attacks the second question as the only one in dispute between us : "In the action of Nature is there any regard to consequences traceable by human investigation, or necessary to foresee the consequences?" He regards this as equivalent to the inquiry whether the existence of God is shown by his works, and of course contests what he supposes to be the scientific view. Most curious of all, however, is his remark that the opening writer evidently regards law and design as inconsistent with each other—in fact as opponents and rivals. We say this is curious, because the writer, desirous of saving his interlocutors from wasting their arguments by proving the abstract possibility of design in Nature, went out of his way to say that the scientific postulate was not opposed to the doctrine that all things are determined by Divine will, and were designed to be as they are. It would seem that orthodoxy of doctrine is not to be tolerated in any advocate of the scientific school, but that he must be preserved in his heterodoxy, in order that the latter may be duly refuted.

Putting the construction he does upon the question, he of course combats it, and thus satisfies the casual reader that he can be relied on to resist the encroachments of the scientists. Then he proceeds to what is really an argument of the most conclusive kind in favor of the scientific hypothesis, by showing that under any other system "no one could foresee the future or provide for it, could know that fire would prepare his food for eating, could have even a motive to partake of food, for he could not know whether food would nourish him." As this argument is clear and conclusive, we accept it in preference to the first.

The duplex character of the theological position is perhaps shown most clearly in the argument of Dr. Clarke. The reader being assured that, in formulating the postulate, the word "antecedent" was intended to mean antecedent in time, will perceive that he begins by contesting the postulate on the same ground as his fellows, namely, that it excludes design. He then proceeds with a

very vigorous but somewhat old-fashioned argument for design. Finally, he meets the question which is really the one at issue, Did the cosmos that we see come by design or by law? But he thinks this question is not the fundamental one, because, admitting it to have come by law, we must then inquire, Did these laws come by chance or design? But, in thus trying to jump over the head of the only question at issue, he makes what is really a complete change of base. Scientific philosophy never raises the question whether the laws of Nature came by chance or design, or were eternal. The question asked was one respecting the course of Nature under existing laws. The only method which science has of inferring the course of Nature outside the sphere of immediate observation is founded on the hypothesis that the laws of Nature are invariable, and the same outside this sphere that they are inside. Therefore, when we come back to the beginning of these laws and ask how they commence, you pass completely out of the sphere of science and of the scientific philosophy.

It is not of the slightest use to tell the scientific school that they ought to consider this question. Even if we granted that they ought to do so, they can still justly claim that we must agree upon what the course of Nature actually is under the existing laws of Nature before we can discuss the beginning of those laws. Therefore the question, did the cosmos that we see come by design or by law, is the living one which Dr. Clarke entirely evades, though indirectly he so far admits it as entirely to destroy the basis of his opening argument. His position seems in brief to be this: I claim that the present state of things came by design and not by law; but, since you may possibly prove, after all, that they came by law, I then take refuge in the fact, which you can not contest, that those laws came by design. On this latter point the scientific philosopher will not join issue with him, because he is concerned only with things which he believes to be within the realm of natural law.

The most lamentable waste of argument is found in the contribution of Mr. Cook. He devotes the greater part of his paper to the refutation of the ancient doctrine that adaptations in the universe came by chance—a doctrine which, so far as the writer knows, has not been maintained by any one for many centuries, and which the school of evolution seeks to dispose of for ever by showing that they came by law. He shows very clearly, as hundreds have shown before him, that the adaptations which we see in Nature necessarily require a precise reason for them; but, when he comes to

the question whether the reason given by the school of evolution can be accepted, he "passes by on the other side."

The results of our examination of the four answers may be summed up as follows :

Considered as arguments for the abstract proposition that there is design in Nature, they leave nothing to be desired. The scientific philosopher can have nothing to say against them, because, whether he admits them or denies them, it is entirely outside his province to pass judgment upon them.

Considered as throwing light on the question how far the scientific philosophy in general, and that of evolution in particular, can be admitted without rejecting final causes in some of their forms, they must, we conceive, be regarded as unsatisfactory. It is true that, on the whole, they are favorable to the idea that there is no necessary antagonism between the two systems. We find in more than one place statements which, carried to their legitimate logical conclusion, would imply that any man who maintained that the theory of evolution is in any way inconsistent with design in Nature is on the high-road to atheism—a proposition which we think will not be received with favor by all theologians. If this view had been consistently adhered to throughout the whole discussion, there would have been scarcely anything to say in reply, and the reader might safely have been left to compare the attitude of the writers with that of the churches which they represent toward the theory of evolution during the past twenty years.

That they should have avoided giving a direct and unconditional positive or negative reply to the question propounded was to be expected. An affirmative reply and acceptance of the scientific postulate, as at least consistent with sound doctrine, whether proven or not, would have been an admission that the great war which has been waged by theology against evolution during the past twenty years was without justification. A very attractive field of controversy would thus have been abandoned. On the other hand, an unconditional denial of the proposition, as inconsistent with sound doctrine, would have been equivalent to maintaining that the whole progress of science during the past three centuries tended to the discredit of religious doctrines, and that the latter could find no foothold whatever in fields which Science had conquered. Every phenomenon, after being reduced to natural laws and explained on scientific principles, would have become a weapon wrenched from the hand of Theology and turned over to its enemy. It could hardly

be expected that a whole school of thinkers would be ready to take either horn of this dilemma. But the writer will confess that he did expect them to grapple with the problem a little more closely, and to make the exact position of Theology in relation to evolution more consistently clear than they have done.

In the minute examination we have been giving to the arguments and positions of our theological interlocutors, and the remarks respecting the position of the scientific philosophy which have been occasionally thrown in, the reader may have failed to gather a view of the actual line of battle; he may be especially bewildered to learn which side the opposing parties are taking in respect to the general compatibility of natural law and design. We must, therefore, ask him to ascend to a higher plane, and trace the line of conflict from its beginning in a single comprehensive view. If in doing this we shall fail to point out anything which has not been shown over and over again during the past ten years, we can only excuse ourselves by a seeming failure on the part of large numbers of thinking men to grasp the real points at issue.

The whole question turns upon a differentiation made by the human mind in all ages between the processes of Nature and the acts of mind. When a tree was felled, or a piece of coal dug from the earth, the operations were those of a directing mind having an end to gain by them, and were not the result of any law of Nature. It was and is quite obvious that there is no law of Nature prescribing that coal shall be dug from the earth or trees be cut down at certain times. These are acts of will and not processes of Nature. On the other hand, when the fuel burns we have a natural process which is the result of an invariable law of Nature. We have repeatedly given what seems to us the clearest definition of the distinction to be made between these two classes of causes, by showing that the one class go on entirely without regard to consequences, while the other have reference entirely to the results to follow. Thus we have a wide and unbridgable chasm between the operations of mind and the laws of Nature—a chasm which, as just remarked, has been recognized by thought in all ages. We trust that the reader sees clearly this distinction between acts of will, so far as we know them here around us, and natural processes.

In early stages of human thought all natural operations were not looked upon as belonging to the second class. It was very well understood that the acts of visible, conscious beings, whether man or animals, might belong partially or wholly to the first class, and that

the operations of inanimate Nature belong principally to the second class. It is with this definition of the operations of Nature proper—that is, all of those processes which have not been designed by the individual will of man or animals—that we are alone concerned, and which we alone include under the term “course of Nature.” The processes involved in this course of Nature were in the beginning of thought supposed to be divided between the two classes already described. Some were supposed to go forward in accordance with invariable natural laws, acting without regard to consequences ; while others were viewed as the acts of beings for the most part invisible, possessing the power of modifying these natural processes, and so changing them from time to time to compass their ends. Thus a conception of Nature which has been termed the dualistic has been the one almost universally entertained in all ages. As an example of dualism we remark that in mediæval times the revolutions of the heavens, the falling of heavy bodies, the course of the ordinary breezes, the combustion of fuel, and the deaths of men from common diseases, were all viewed as natural processes ; while the appearance of the comet, the rush of the tornado, and the outbreak of the pestilence were viewed as partially the direct result of will, acting independently of the laws of Nature, and so having a supernatural origin.

While this classification on the dualistic system was clear in its general conception, it was by no means clear in its application to special cases. As Nature was investigated, it was found from time to time that operations which had at first been supposed to belong to the supernatural could be fully explained by natural laws. Thus, there was a constant tendency to transfer events from the one class to the other. There were also great changes in the conception of the characters supposed to possess these supernatural powers. From being divided among a great number of spirits, many of the lowest, but none of the highest order, the power was gradually concentrated under the monotheistic system into the hands of a single Supreme Being, Maker of heaven and earth.

As knowledge increased it became more and more evident to careful thinkers that the operations, at least of contemporary natures, all belonged to the class of natural processes, and thus men divided into two classes. These were, on the one side, the devout and religious, who still held that certain occurrences, of which the cause and natural relations were obscure, and in which the interests of mankind were deeply involved, might occur one way or the other

according to the arbitrary fiat of the Supreme Will. The other included the less devout or wholly irreligious, who maintained that the classification was founded wholly upon our ignorance, and that an increase in our knowledge of natural laws would result in explaining all occurrences by purely natural processes. Thus arose the monistic school, which maintained the absolute unity of Nature, and claimed that all events were to be explained by natural law.

This school gradually triumphed in so far that intelligent men gradually ceased to make any specific and well-defined claim that the course of Nature was modified, or turned aside in any visible manner or in any concrete case by the action of the Supreme Will. But there was one field into which it was entirely unable to enter, namely, that of the adaptation of living beings to the circumstances by which they were surrounded. The structure of the human eye, hand, and ear revealed a harmony with the world in which we were placed, and an adaptation to the purposes they were to subserve, which must have been the result of an adequate cause. It was clearly seen that no doctrine of fortuity could account for such adaptation. The resemblance to the works of ingenious men who make machinery to carry out preconceived processes was so great that only one explanation seemed possible. Man and animals were the direct work of a designing Mind, possessed of a knowledge and ingenuity far exceeding that of man. Thus arose our modern natural theology, devoted to showing final causes in Nature and relying for its proof principally upon those adaptations which we see in animate Nature, which could not have been the result of chance, and which to all appearance could be accounted for only by the doctrine of final causes. Connected with these ideas is the popular cosmogony of the present day. At some time far back in the ages, matter was created and endowed with certain properties of attraction, repulsion, and affinity by the Omnipotent, Self-existent Mind. At another time the heavens and the earth were constructed by Divine art, and the materials so wisely adjusted that their operations should go on for ever in exact accordance with a prearranged plan. At another time plants were started growing and imbued with the power of continuing their kind. At another, animals were brought into existence in the same way, each species being an independent creation. The spectator, looking down upon the earth at one time, would have seen a tree or forest, at another a lion, at a third a full-grown man, possessed of all his faculties, made out of the dust of the earth, as a watchmaker makes a watch. Perhaps he would also

have seen the denizens of a higher sphere walking the earth and singing together in joy over the new creation. With this theory is associated the sublimest conception which has come down to us through the ages—that of a day when all the men who have lived on the earth shall meet face to face ; when every wrong shall be righted ; and when a new heaven and earth, free from all the imperfections of the present, shall be created.

This theory may be considered as holding supreme sway until very recently. It could be opposed only on grounds of general skepticism, but could not be supplanted by any other equally definite. It is true that, toward the close of the last century, the promulgation of the nebular hypothesis accounted for a large portion of what had been before considered creation in a different way. But, beyond making the creation of the world as we find it a natural instead of a supernatural process, the reception of this theory did not make any radical change in the ideas of men. It was also too recondite in its nature, and too far removed from ordinary ideas, to be appreciated by any but the learned. Most of all, the creation thus accounted for was not one which had been supposed to show any striking adaptations or marks of design. For this last reason the nebular hypothesis never became a bitter bone of contention between the monistic and the dualistic schools.

Twenty years ago the contest assumed an entirely new phase by the promulgation of the theory of evolution in Darwin's "*Origin of Species*." The object of this work was to show that all living beings, with their adaptations to external circumstances, were really the product of natural laws, and were not especially created. The attempt was made to show that these beings had originated in the very smallest and lowest forms of life, in collections of matter which could hardly be defined as living or dead, and had attained to their present development by purely natural generation. The processes of Nature by which this result was brought about were clearly enunciated and classed with gravitation, chemical affinity, and other previously known laws. Thus the monistic philosophy sought at one step to take possession of almost the whole field which had hitherto been occupied by natural theology as its exclusive domain.

The progress of the new idea was bitterly contested at every step on the part of Theology. It was clearly seen that, if once accepted, it involved the genetic connection of man with the lower animals, and the elimination of the supernatural from creation. Nat-

uralists themselves were at first so much divided that it was difficult to say which side would eventually triumph. But the more carefully the theory was examined, and the more minutely the relations of structure between allied species of animals were studied, the more clearly it appeared that they all pointed to the common origin of all animal life. The opponents of the theory gradually fell away, and none entered to fill their places. So complete has the revolution now become, that it is hardly possible to name a biologist of distinction who still opposes it. It is taught by naturalists as an established law. It is even used as a key for explaining the structure of animals, and among a certain class of thinkers it is rapidly becoming the basis of a new theory of the mental faculties, as well as of the material structural organization of man. The mind of man is now viewed as containing an epitome of the mental history of his ancestors, in which those faculties inherited from the brute nature can be differentiated from such as are the product of civilization. Intellect is thus studied as a slow development through countless generations.

This almost universal acceptance of evolution, by the men who ought to be best qualified to judge of its truth, is a fact of to-day to which it would be folly to shut our eyes. How far their views are well founded, and what objections they might be subjected to on sound philosophical grounds, are questions upon which it is impossible for us now to enter at length. We shall only remark in general terms that, in the present state of biological knowledge, it does not seem possible to frame arguments for evolution which are not based on the theory of uniformity in the methods of Nature. The theory of special creation has this vantage-ground, that, once adopted, it will account for anything. It is just as easy to suppose one thing created as another—the most complex animal as the most insignificant mass of protoplasm.

Special creation being thus sufficient to account for anything, the only possible objection to it can be compressed into the single assertion that that is not the way in which Nature does business. Evolution presupposes that we have discovered the plan and method of Nature by induction from processes that we see going on around us. The most general result of that induction is, as the writer conceives, formulated in the postulate with which he opened this subject, namely, that the course of Nature, considered as a succession of phenomena, is determined solely by antecedent causes, in the action of which no regard to consequences can be traced by human investi-

gators, or is necessary to foresee the result. Evolution itself being founded on this postulate, we are justified in taking the latter as an expression of the highest generalization of science, respecting the course of Nature. With this generalization, evolution, and every other conclusion respecting things which lie without the range of observation, must stand or fall.

If we accept this postulate with all its logical consequences, how far must we give up or modify religious doctrine? This is a question which the scientist is entirely incompetent to answer, and which, so far, the theologians have utterly failed to answer in a satisfactory way. It is one on which the evolutionists differ as widely as others. We may contribute a single suggestion toward an answer, by stating what we conceive to be the relation of the scientific postulate to design in Nature, premising that our views have here no scientific weight whatever, and that they are put forward only because the subject is neglected by those who are more competent.

That there is no antagonism between the scientific postulate and the abstract doctrine of design in Nature is an opinion which the writer has repeatedly expressed, both in these papers and elsewhere. The abstract doctrine alluded to may have various forms. It may be supposed that the whole course of Nature is ultimately to converge toward some end which we are still unable to foresee, but which is completely planned out from the beginning; or it may be supposed that everything in Nature was designed to be exactly as it has been and as it will be. In these and allied views there is nothing to conflict with the scientific postulate—nothing, in fact, which has any relation to it. But when we inquire whether we know what these ends of Nature were and are—whether we can use such knowledge in the scientific explanation of the course of Nature, or whether the latter can be scientifically explained without reference to design—we reach questions of an entirely different class. It is one thing to say that there is design in Nature, or that all things were designed to be as they are, but an entirely different thing to say that we know these designs, and are able to explain and predict the course of Nature by means of them.

The scientific philosophy entirely excludes design as affording that explanation of Nature which it desires, that is, such an explanation as will enable men to foresee the course of Nature. It is true that until recently the theory of design did serve a certain purpose in explaining the structure of animals, and in giving that foresight

which is the requirement of science. But it was gradually found that, as a scientific theory, it wholly failed in the element of generality of application, and led to greater and greater difficulties the further knowledge advanced. Finally, in the opinion of the large majority of naturalists, it was rendered entirely unnecessary by the theory of evolution, and therefore had to be dropped as a method of scientific explanation. It was maintained that nearly or quite every circumstance, which had before been accounted for on the theory of design and special creation, could now be better accounted for on the theory of certain permanent, natural processes, determined by invariable laws. Thus it is sought to relegate design entirely to the province of the theologian, who can place it behind all natural laws, but is not to use it as a scientific theory.

The relation of evolution to design may be seen in a yet different light, by regarding the scientific postulate as expressive simply of the unity of Nature with respect to plan and method. All definitions of the phenomena of Nature, in general and abstract terms, such as we have used in formulating the postulate, are subject to this inconvenience: that we apprehend the meaning of the terms used only by their unconscious reference to special objects. As our ideas of a man, an animal, a metal, or a color are derived only by having special objects presented to us to which we have learned to apply these names, so the ideas which we attach to the most general philosophic terms are derived in the same manner. We may, therefore, avoid a possible failure to understand correctly the idea presented, by dispensing with general definition of the course of Nature, and considering the postulate as expressive of the doctrine that Nature always has been what we now see it, and is in all its realms as we see it around us every day. This doctrine is sometimes known under the name of *monism*, to distinguish it from the dualistic conception of Nature, which views the latter as involving two distinct classes of causes, the natural and supernatural. Unfortunately, however, the term has been applied, not only to the doctrine of the unity of Nature, but to that of the unity of mind and matter, which is an entirely different and, in some aspects, an antagonistic one. We have, therefore, preferred the term scientific philosophy to that of monistic philosophy, in treating of this subject.

Which term so ever we use, the result of the doctrine is, that there is neither more nor less of design in any one process or result of Nature than in another. It does not deny the striking harmonies

cited by Dr. Clarke from Janet, but only maintains that these harmonies, like all others, are products of natural laws. It objects to making such harmonies the basis of the conclusion intended to be drawn from them. It is not that the conclusion is necessarily false, but that they are no better fitted to sustain the conclusion than are other striking harmonies which we see before us every day, and which we at once recognize as results of well-known natural laws. Without attempting to penetrate into the origin of the creative power, the doctrine maintains that this power was never exerted in any more striking manner than it is exerted before our eyes at the present time. The creation of all living beings and their adaptations to the conditions which surround them are results of a process which we see going on around us every day, and which depend upon laws as certain and invariable in their action as those of chemical affinity or of gravitation. It sees throughout Nature a certain life-evolving power which shows itself in various forms, as heredity—the continual increase of life—the *vis medicatrix naturæ*.

If you ask, Whence this power? it replies, Whence gravitation? whence the chemical properties of matter? whence Nature itself? It sees this life-evolving power exerted in a certain relation to surrounding circumstances, so that every form of animal life has a tendency to adapt itself to those circumstances. All life not adapted to its surroundings is necessarily destroyed, thus leaving only what is so adapted. Thus Nature is viewed as one grand whole, the basis of which is involved in mystery in every direction, and which the scientist studies simply to understand the relation of its phenomena. Everything which lies behind or above this he leaves for investigation by other methods than those with which he is conversant.

Such is the highest generalization of the scientific thinker respecting the method of Nature. Is it only a daring flight of the imagination, and its supposed foundation on observed facts only an idol of the tribe, which a rigorous logic will show to be entirely without justification? This is a scientific question which may yet loom up into greater importance than it has heretofore. Is it consistent with religious truth? This is a question for theologians, and one which we hope they will answer a little more boldly than they now do.

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